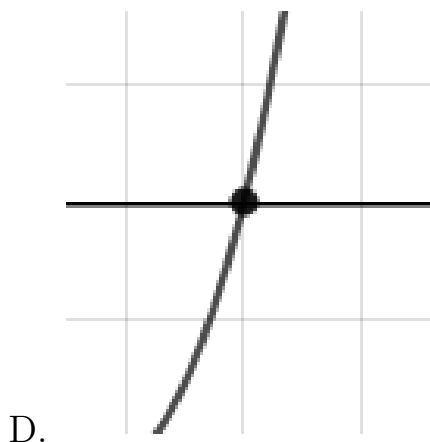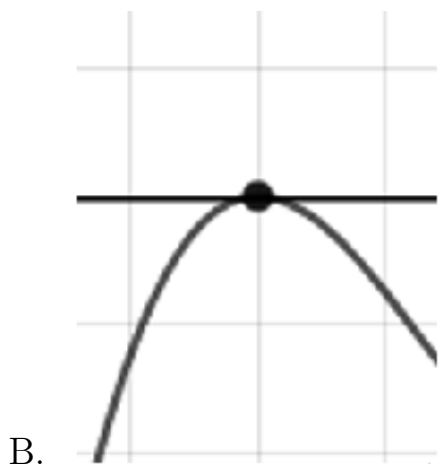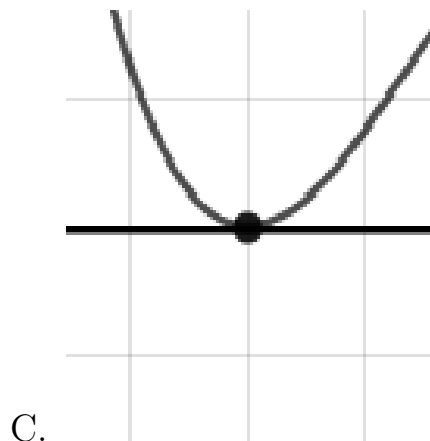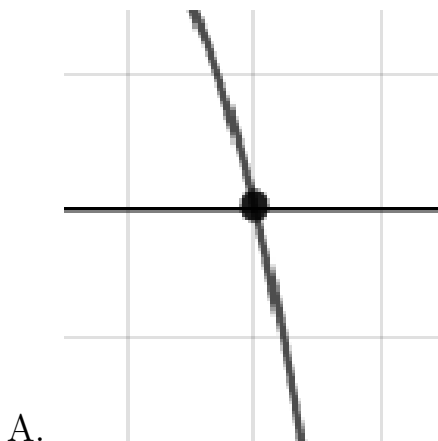1. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{5}{3}, \frac{-1}{4}, \text{ and } \frac{-5}{2}$$

A. $a \in [23, 25], b \in [-28, -20], c \in [-98, -94],$ and $d \in [21, 27]$

B. $a \in [23, 25], b \in [106, 107], c \in [123, 131],$ and $d \in [21, 27]$

C. $a \in [23, 25], b \in [26, 29], c \in [-98, -94],$ and $d \in [21, 27]$

D. $a \in [23, 25], b \in [26, 29], c \in [-98, -94],$ and $d \in [-26, -21]$

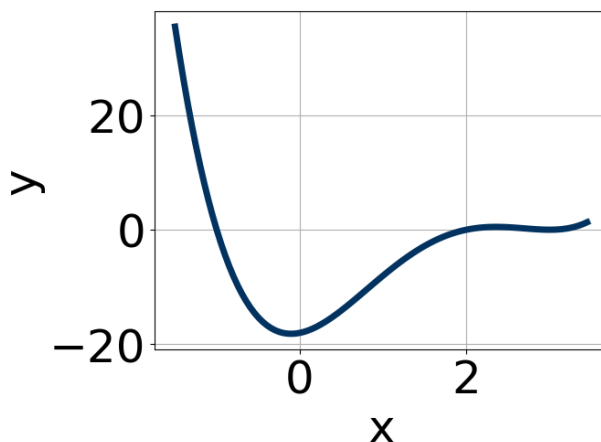E. $a \in [23, 25], b \in [90, 99], c \in [74, 78],$ and $d \in [-26, -21]$

2. Describe the zero behavior of the zero $x = -3$ of the polynomial below.

$$f(x) = -2(x-3)^4(x+3)^7(x+2)^7(x-2)^{10}$$

A.

C.

B.

D.

    E. None of the above.

3. Which of the following equations *could* be of the graph presented below?

    A. $18(x-3)^4(x-2)^{10}(x+1)^{11}$

    B. $5(x-3)^{10}(x-2)^{11}(x+1)^{11}$

    C. $-14(x-3)^{10}(x-2)^{11}(x+1)^4$

    D. $18(x-3)^7(x-2)^4(x+1)^7$

    E. $-10(x-3)^4(x-2)^9(x+1)^{11}$

4. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-3 - 4i \text{ and } -3$$

    A. $b \in [-3, 3], c \in [6.2, 9.3],$ and $d \in [12, 14]$

    B. $b \in [-12, -8], c \in [42, 47.2],$ and $d \in [-75, -74]$

    C. $b \in [9, 13], c \in [42, 47.2],$ and $d \in [72, 82]$

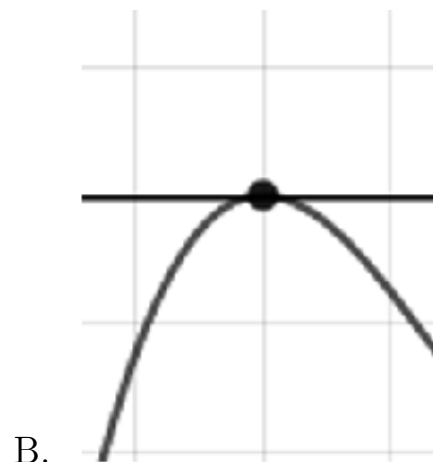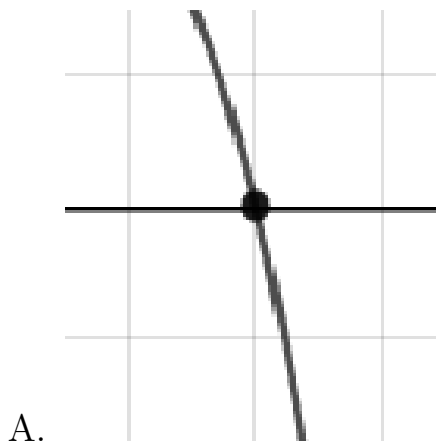   D. $b \in [-3, 3], c \in [2.5, 6.7],$ and $d \in [5, 11]$

    E. None of the above.

5. Which of the following equations *could* be of the graph presented below?
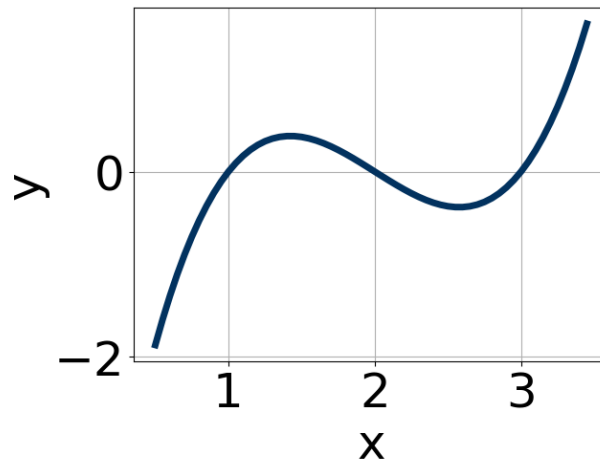
A. $-20(x-1)^8(x-2)^9(x-3)^5$

B. $20(x-1)^8(x-2)^5(x-3)^7$

C. $-5(x-1)^{11}(x-2)^{11}(x-3)^5$
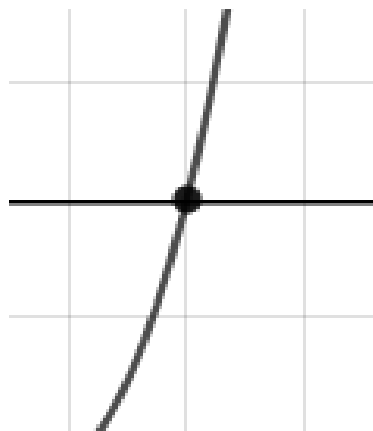
D. $4(x-1)^7(x-2)^5(x-3)^9$

E. $7(x-1)^8(x-2)^6(x-3)^7$

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6. Describe the zero behavior of the zero $x = 5$ of the polynomial below.

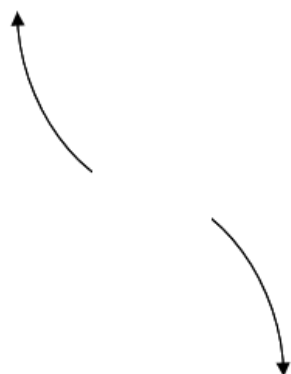$$f(x) = 4(x-2)^6(x+2)^3(x-5)^7(x+5)^2$$

A.

B.

C.

D.

E. None of the above.

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7. Describe the end behavior of the polynomial below.
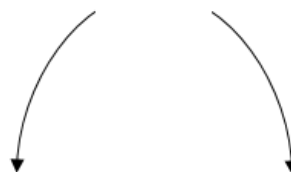
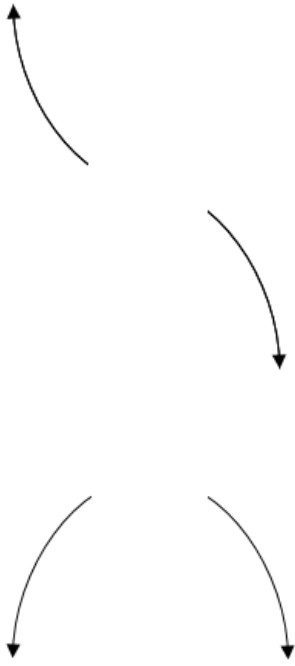$$f(x) = -2(x+2)^3(x-2)^8(x-9)^4(x+9)^6$$

C.

A.

B.

D.
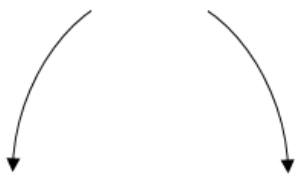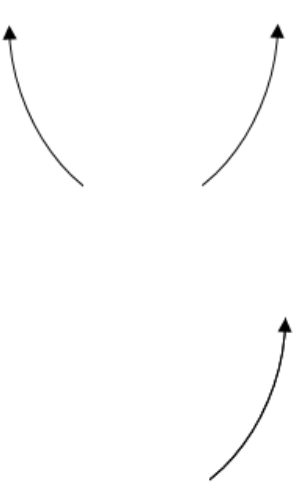
E. None of the above.

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8. Describe the end behavior of the polynomial below.

$$f(x) = -4(x-5)^5(x+5)^8(x-4)^5(x+4)^5$$

C.

A.

B.   D.

E. None of the above.

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9. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{4}{3}, \frac{1}{4}, \text{ and } 1$$

A. $a \in [11, 21], b \in [-0.6, 2.1], c \in [-19.5, -16.4],$ and $d \in [2, 6]$

B. $a \in [11, 21], b \in [1.5, 8.2], c \in [-16, -14.6],$ and $d \in [-6, 0]$

C. $a \in [11, 21], b \in [30.9, 32.5], c \in [20.5, 27.3],$ and $d \in [2, 6]$

D. $a \in [11, 21], b \in [-32.9, -28.5], c \in [20.5, 27.3],$ and $d \in [-6, 0]$

E. $a \in [11, 21], b \in [-32.9, -28.5], c \in [20.5, 27.3],$ and $d \in [2, 6]$

10. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-2 + 3i \text{ and } -1$$

A. $b \in [0.1, 3.9], c \in [-7, 0],$ and $d \in [-5.5, -1.1]$

B. $b \in [-10.8, -3], c \in [12, 26],$ and $d \in [-14.5, -9.4]$

C. $b \in [0.1, 3.9], c \in [2, 8],$ and $d \in [0.4, 3.8]$

D. $b \in [2.5, 6.7], c \in [12, 26],$ and $d \in [12.3, 16.1]$

E. None of the above.